

REMARKS

Amendments

Claims 56-61, 64-68, 84-93, and 96-100 are currently pending in the application.

Claim 84 has been amended solely to expedite patent prosecution in accordance with the U.S. Patent Office Business Goals (65 Fed. Reg. 54604 (September 8, 2000)). Applicants reserve the right to present any previously presented subject matter in a co-pending application.

Claim 84 has been amended to recite “the bottom surface being polished to allow for optical coupling to a second bundle of optical fibers” (see, *inter alia*, page 34, lines 13-24 and page 37, lines 21-26 of the originally filed application).

This amendment is supported by the application as originally filed, and do not constitute new matter. Specific support for the amendments is shown in parentheses, above. Entry of these amendments is respectfully requested.

Priority

The Examiner states that the effective filing date of the instant application has been determined to be September 18, 2000, as provided by parent U.S. Application Serial No. 09/664,197 (Office Action, page 2).

Withdrawal of Previous Rejections and Objections

All previous ground of objection and rejection have been withdrawn, including: 1) the objection to the specification for containing an active hyperlink; 2) the new matter rejection of the claims under 35 U.S.C. §112, first paragraph; 3) the indefiniteness rejection of the claims under 35 U.S.C. §112, first paragraph; and 4) the rejection of the claims under 35 U.S.C. §103(a) based on Chee et al. U.S. 2003/0108867 (“Chee”; Office Action, pages 2-3).

35 U.S.C. § 103(a)

Claims 56-61, 64-68, 84-93, and 96-100 have been newly rejected under 35 U.S.C. §103(a) as allegedly unpatentable over Chee in view of Kain et al. U.S. 2002/0039728 (“Kain”; Office Action, page 3).

The Examiner states that Chee does not explicitly disclose: 1) the diameter of the claimed optical fiber; 2) the thickness of the claimed cavitated fiber optic bundle (i.e., a fiber optic wafer); 3) the various separation distances between the nucleic acids on the claimed fiber optic bundle; and 4) polishing the end of a cavitated fiber optic bundle to allow optical coupling to a second fiber optic bundle (Office Action, pages 4-5).

However, the Examiner states that Kain discloses: 1) a fiber optic bundle of “any length” (modified to obtain a fiber optic wafer); 2) arrays having sites separated by less than about 5 μm -15 μm or 15 μm -30 μm ; and 3) a fiber optic bundle with polished ends (Office Action, page 5).

The Examiner indicates that it would have been obvious to one of skill in the art at the time the invention was made to modify the teachings of Chee with the teachings of Kain to arrive at the invention as claimed (Office Action, page 5). Applicants respectfully traverse this rejection as follows.

1. Declaration of prior invention under 37 C.F.R. §1.131

Kain was filed on February 12, 2001 and claims priority to U.S. Provisional Application 60/181,631 (“the Kain Provisional”) filed February 10, 2000. Applicants have submitted herewith a Declaration by Dr. Jonathan M. Rothberg under 37 C.F.R. §1.131 (“Rothberg Declaration”) to demonstrate invention of the claimed subject matter of a cavitated fiber optic wafer for a substrate and apparatus (“the Wafer”) prior to the Kain Provisional (Rothberg Declaration, ¶ 2).

The Rothberg Declaration confirms the earlier conception and constructive reduction to practice of the claimed invention of the Wafer as evidenced by U.S. Application No. 09/398,833 (“the ‘833 Application”) filed on September 16, 1999 (Rothberg Declaration, ¶¶ 3-4). The ‘833 Application teaches, *inter alia*, a substrate comprising a cavitated fiber optic wafer for analyzing nucleic acids and an apparatus for processing a plurality of nucleic acids (Rothberg Declaration, ¶¶ 5-10). The teachings of the ‘833 Application demonstrate the invention of the claimed subject matter of the Wafer before September 16, 1999, thereby antedating the Kain Provisional (Rothberg Declaration, ¶ 11).

As required under 37 C.F.R. §1.131, Applicants need only to show as much of the claimed invention as the cited reference shows. *In re Stryker*, 435 F.2d 1340, 1341 (C.C.P.A.

1971); *In re Wakefield*, 422 F.2d 897, 902 (C.C.P.A. 1970); *In re Stemple*, 241 F.2d 755, 759-60 (C.C.P.A. 1957); MPEP §715.02. Applicants need not set forth the reduction to practice of every embodiment of the invention, or the disclosure necessary to support a claim under 35 U.S.C. §112. *In re Hostettler*, 356 F.2d 562, 565 (C.C.P.A. 1966). A cited reference is considered valid only for what it discloses. *In re Tanczyn*, 347 F.2d 830, 832-33 (C.C.P.A. 1965). If Applicants establish priority with respect to that disclosure, the reference is deemed to have no effect. *In re Tanczyn*, 347 F.2d at 832-33; *Stemple*, 241 F.2d at 759-60.

Here, the Rothberg Declaration demonstrates prior invention for at least the disclosure of Kain as cited by the Examiner (Office Action, page 5; see above). Kain is thereby removed as a reference against the claims of the instant application. By itself, Chee does not teach or suggest all of the limitations of the instant claims (Office Action, pages 4-5). Chee was withdrawn by the Examiner in view of the previous Declaration of Dr. Margulies (Office Action, page 3). It is well established that all of the claim limitations must be taught or suggested by the applied references to establish *prima facie* obviousness. *In re Royka*, 490 F.2d 981, 985 (C.C.P.A. 1974); MPEP §2143.03. Here, Kain is unavailable as a reference and Chee is unable to stand alone against the claims. Therefore, a *prima facie* case of obviousness has not been established against pending claims 56-61, 64-68, 84-93, or 96-100 of the instant application.

2. Polished ends to allow optical coupling to a second fiber optic bundle

Although Kain is removed as a reference against the claims, Applicants respectfully ask to clarify certain aspects of the invention. As amended, claims 84-87 and 96-100 encompass an apparatus comprising, *inter alia*, a wafer with a highly polished bottom surface to allow for optical coupling to a fused bundle of optical fibers (see above).

The Examiner states that Kain reports use of a fiber optic bundle with polished ends (Office Action, page 5). On its face, Kain lists U.S. Provisional Application No. 60/181,631 (Kain Provisional) as a priority document. However, Kain Provisional fails to teach or suggest the use of a fiber optic bundle of *any length* or a fiber optic bundle with *polished ends*. The recitations of “polishing to planarize the surface of the ends” and “fiber optic bundle of length L, where L can be in theory any length” appear to have been specifically added the Kain reference [¶¶ 0080, 0073], which was filed on February 12, 2001. Applicants note that the filing date of

Kain falls *after* the priority date of the instant application. Because Kain Provisional fails to teach or suggest the use of a fiber optic bundle of *any length* or a fiber optic bundle with *polished ends* prior to the filing or priority dates of the instant application, Kain cannot make obvious claims 84-87 or 96-100 as presented herein.

Moreover, neither Kain nor Kain Provisional teach or suggest the *optical coupling* of the polished end of a fiber optic bundle to a second fiber optic bundle. Kain Provisional reports the use of *scanning* (i.e., microscope) equipment with the arrays (see, page 1, ¶¶ 4(1) to 4(2); page 2, ¶ 4(5); page 3, ¶10; and page 4, ¶ 11(2)). Kain also reports the use of *scanning* (i.e., microscope) equipment with the arrays (see, ¶¶ [0061], [0062], [0064], [0194], and Figure 11). In contrast, amended claim 84 recites “the bottom surface being polished to allow for optical coupling to a second bundle of optical fibers.” Claims 85-87 and 96-100 ultimately depend from claim 84. Therefore, these pending claims of the application include the subject matter of a fiber optic bundle with polished ends that allow optical coupling to a second fiber optic bundle.

As previously noted, all of the claim limitations must be taught or suggested by the applied references to establish *prima facie* obviousness. *In re Royka*, 490 F.2d at 985; MPEP §2143.03. Yet, Kain did not teach or suggest the use of a fiber optic bundle with polished ends prior to the filing or priority dates of the instant application. Chee fails to provide this missing teaching (see, Office Action, page 5). In addition, neither Kain Provisional nor Kain teach or suggest the optical coupling of the polished end of a fiber optic bundle to a second fiber optic bundle. Chee again fails to provide this missing teaching (see, Office Action, page 5). Thus, a *prima facie* case of obviousness has not been established against pending claims 84-87 or 96-100 of the instant application.

3. Fluid means for delivery of pyrophosphate sequencing reagents

As further clarification, Applicants note that claims 84-87 and 96-100 presented herein encompass an apparatus comprising, *inter alia*, a fluid means for delivering pyrophosphate sequencing reagents from one or more reservoirs to a flow chamber (see above). Kain and Chee fail to teach or suggest such fluid means.

Kain Provisional reports the use of arrays for *hybridization analysis* rather than sequencing (see, page 3, ¶4(7)). Kain also reports the use of arrays for *hybridization analysis*

rather than sequencing (see, ¶ [0157], [0282], and Figure 3). Chee reports a *dipping mechanism* for sequencing. The method involves inverting long optical fibers and sequentially dipping the tips into individual cups filled with solutions of single nucleotides (see, ¶¶ [0192] to [0195]). In contrast, instant claim 84 recites a “fluid means for delivering additional pyrophosphate sequencing reagents, including sequential delivery of nucleotide triphosphates, from one or more reservoirs to the flow chamber.” Claims 85-87 and 96-100 ultimately depend from claim 84. Therefore, all of the apparatus claims include the subject matter of a fluid means for delivering pyrophosphate sequencing reagents to a flow chamber.

It is again noted that all of the claim limitations must be taught or suggested by the applied references to establish *prima facie* obviousness. *In re Royka*, 490 F.2d at 985; MPEP §2143.03. Here, Chee fails to teach or suggest the use of a fluid means for delivering pyrophosphate sequencing reagents to a flow chamber. Kain fails to supply this missing teaching. Thus, a *prima facie* case of obviousness has not been established against pending claims 84-87 or 96-100 of the instant application.

4. Summary

For all of the reasons presented herein, Applicants respectfully submit that Chee and Kain do not make obvious the subject matter of pending claims 56-61, 64-68, 84-93, or 96-100 under 35 U.S.C. §103(a). Withdrawal of this ground of rejection is respectfully requested.

CONCLUSION

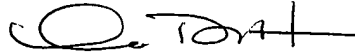
Applicants believe that the claims as amended are patentable and a prompt allowance is respectfully requested. If further discussion of this case is deemed helpful, the Examiner is encouraged to contact the undersigned at the telephone number provided below, and is assured of full cooperation in progressing the instant claims to allowance. While Applicants believe that no additional fees are required, the Commissioner is authorized to charge or credit the undersigned Deposit Account No. 50-0311, Reference No. 21465-501 CIP2, Customer No. 35437, for any additional fees needed.

U.S. Application Serial No. 09/814,338
Inventors: Jonathan M. Rothberg, et al.

Attorney Docket No. 21465-501 CIP2

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Respectfully submitted,



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